6—1 Proportions

Ratio—compares two quantities

a : b $\frac{a}{b}$

Example
1860 students
310 athletes

Athlete: student ratio

$\frac{310}{1860}$ $\frac{31}{186} = \frac{1}{6}$

Athlete: non-athlete ratio

$\frac{310}{1550} = \frac{1}{5}$ 1:5

Must convert to the same unit! meter

K H D Base D C M

200cm

2m

40cm

200 l : w

$\frac{200}{40}$ $\frac{5}{1}$

Simplify

2 ft : 20 in

24 : 20

6 : 5

12 ft : 5 yd (3ft = 1yd)

The ratio of 2 supplementary angles is 4:5. What are the measures of the angles?

$4x + 5x = 180$

$9x = 180$

$x = 20$

$4x20$ $5x20$

80° 100°

The ratio of the angles in a triangle are 2:3:4. What are the measures of the angles?

$2x + 3x + 4x = 180$

$9x = 180$

$x = 20$

40° 60° 80°

The ratio of the ~~sides~~ of a triangle are 5:12:13. The perimeter is 90 cm. What are the lengths of the sides?

$5x + 12x + 13x = 90$

$x = 3$

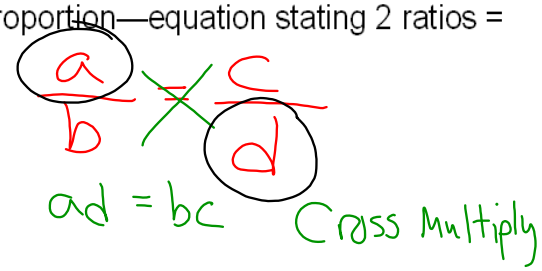
15cm 36cm 39cm

Do:

1. The ratio of the angles in a triangle are 1:5:6. Find the angles.

2. The ratio of the angles in a triangle are 3:5:7. Find the angles.

Proportion—equation stating 2 ratios =



"a is to b as c is to d"

Product of Means = Product of the extremes

Examples

$\frac{a}{b} = \frac{c}{d}$ $\frac{a}{c} = \frac{b}{d}$

$\frac{b}{a} = \frac{d}{c}$

$\frac{12}{9.1} = \frac{3}{y}$ $\frac{6}{18.2}$

$y = 27.3$

$$\frac{4x-5}{3} = \frac{-26}{6}$$

$6(4x-5) = 3(-26)$

$24x - 30 = -78$

$24x = -48$

$x = -2$

$L = 40$ ft $W = 9$ ft

Scale Model

$L = 16$ in $W = 3.6$ in

$\frac{40}{16} = \frac{9}{w}$ $\frac{40}{9} = \frac{16}{w}$

Homework
p. 285-286
#s 12 -25 all, 29-35odd